THE CITY OF WHITTIER

Gateway to Western Prince William Sound

P.O. Box 608 • Whittier, Alaska 99693 • (907) 336-1490 • Fax (907) 472-2404

WHITTIER CITY COUNCIL
SPECIAL MEETING
TUESDAY, DECEMBER 4, 2018
AT 6:00 PM
COUNCIL CHAMBERS
3rd fl. PUBLIC SAFETY BUILDING

AGENDA

1. **CALL TO ORDER**

2. **OPENING CEREMONY**

3. **ROLL CALL**
   A. Council Members Present
   B. Administration Present

4. **APPROVAL OF SPECIAL MEETING AGENDA**

5. **RESOLUTION**
   Res. # 31-2018 - A Resolution of the City Council of Whittier, Alaska appointing Jim Hunt as City Manager for 3 years.

6. **NEW BUSINESS**
   A. PN&D
   B. P-12 disposal/Marketing

7. **COUNCIL DISCUSSION**

8. **CITIZEN'S DISCUSSION**

9. **COUNCIL AND ADMINISTRATION'S RESPONSE TO CITIZEN'S COMMENTS**

10. **ADJOURNMENT**

CITY OF WHITTIER, ALASKA
RESOLUTION #31-2018

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WHITTIER, ALASKA, APPPOINTING JIM HUNT AS CITY MANAGER FOR THREE YEARS

WHEREAS, the Whittier City Council appointed Jim Hunt the Interim City Manager on December 4, 2018, for a term to end on December 4, 2021; and

WHEREAS, the Whittier City Council has found Jim Hunt's performance as Interim City Manager to be satisfactory and wishes to appoint him as the permanent City Manager for a term of three years; and

NOW, THEREFORE, BE IT RESOLVED by the Whittier City Council that Jim Hunt is hereby appointed the permanent City Manager for a term of three years, upon such other terms as Jim Hunt and the City Council shall agree on.

PASSED AND APPROVED by a duly constituted quorum of the Whittier City Council on this 4th day of December, 2018.

_____
Daniel Blair
Mayor

ATTEST:

_____
Naelene Matsumiya
City Clerk

Introduced by: City Council

Ayes:
Nays:
Absent:
Abstain:

CITY OF WHITTIER DELONG DOCK

2018 Condition Inspection Report

Prepared For:

P.O. Box 639
Whittier, Alaska 99693

Prepared By:

PND ENGINEERS, INC.

1506 West 36th Avenue
Anchorage, Alaska 99503

DRAFT - November 2018

1.0 INTRODUCTION

The Delong Dock in Whittier, Alaska was designed and constructed by the US Army Corp of Engineers in 1953 and served as a supply port for military operations. The dock structure consists of two steel barges, 250-foot and 427-foot in lengths, supported by 6-foot diameter steel caissons. An 8 to 10-inch thick reinforced concrete deck surface covers the barge driving surfaces. Many utilities such as the impressed current cathodic protection (CP) system, fire standpipe system and monitors, piping and electrical conduit are also present on south face the structure. Today, the dock is primarily utilized by commercial fishing and light commercial industries.

The City of Whittier (City) obtained ownership of the facility in the second quarter of 2018. The City contracted with PND Engineers, Inc. (PND) to conduct a condition inspection of the dock and to provide recommendations on the continued use of the structure. The most recent in depth condition assessment of the above and below water components of the structure was performed with joint efforts between R&M Consultants, Inc., RSA Engineering, and American Marine in 2014 for the previous owner, the Alaska Railroad Corporation. This is the only known structural inspection of the dock. Little is known about maintenance or repairs to the structure prior to this assessment. The 2014 inspection report was provided for PND to verify the extent of recommended repairs and/or changes in observed deficiencies.

PND prepared this report to summarize the current condition of the Delong Dock. An overview of the structural condition is presented based on recent visual inspections above water, past observed deficiencies, supplemental non-destructive testing, and repair history. This report is intended to aid the City in evaluating short and long term planning decisions for the dock's operations. Repair recommendations with conceptual level design, drawings, and cost estimates are presented herein.

2.0 INSPECTION PROCEDURE

PND mobilized two inspectors, Corey Roche, P.E. and Michael Beglin, P.E., on Thursday September 14, 2018 to perform a visual inspection and evaluation of the existing structure above water, excluding mechanical and electrical components. Supplemental ultrasonic (UT) thickness measurements and cathodic potential readings were taken at select locations for comparison with the previous condition assessment.

An underwater inspection was not conducted as part of this project scope. The previous underwater inspection was conducted in 2014. The American Association of State Highway and Transportation Officials (AASHTO) and American Society of Civil Engineers (ASCE) inspection guidelines typically recommend dive inspection every 5 to 6 years, however shorter inspection intervals are recommended for aging or deteriorated structures.

General Condition Observations

Inspection methods primarily consisted of visual means aided by use of some hand tools. All accessible components of the dock were inspected with exception of the mechanical and electrical components. Topside inspection included components of the deck, bullrails, life rings, fire extinguishers, light poles, ladder supports and fender connections. Inspection of the barge interiors was not included in this scope due to the proximity of the full 2014 inspection where a full inspection was performed on the hull interiors.

If inspection of the interior sections of the barge becomes necessary during repair work or future inspections additional preparation, support equipment, and personnel will be required to safely access and inspect this confined space. Below deck components were viewed from a skiff and included the barge hull, support caissons, light pole connections, ladders, and fender components.

PND personnel inspected the structure for consistency with available design drawings and deficiencies that may affect structural integrity or public safety. Inspection also focused on further investigation and evaluation of the previously identified findings and recommendations of the 2014 inspection. See Section 3.0 for detailed information on individual components.

Steel Thickness Measurements

Ultrasonic testing (UT) thickness measurements were taken on two (2) caissons and five (5) hull areas between the two barges (see Appendix C for field data). UT readings taken on the hull of the east barge were obtained for the vertical face only due to tide levels restricting access to the caissons and hull bottom. Several UT measurements were taken to gather an average remaining steel caisson thickness and to determine any trends in the corrosion rates. Dimensional measurements were also taken from each test location to the bottom of the barge hull to provide a consistent and precise reference point for the test locations despite rising or falling tide level as the inspection progressed.

Due to heavy corrosion and marine growth found on the barge, it was necessary to remove rust and marine deposits with a grinder prior to taking UT measurements. All UT measurements were taken with a Cygnus-1 Heavy Duty digital thickness gauge (ultrasonic multiple echo).

CP Voltage Potential Readings

Cathodic potential readings between a Silver/Silver Chloride (SSC) reference electrode and the steel caisson were performed to assess performance of the corrosion protection system. Voltage potential readings were gathered at 5-ft intervals from the water surface to mudline for two (2) caissons (see Appendix D for data).

A voltage potential of -800 mV SSC is generally accepted as the design protective potential for carbon and low-alloy steels in seawater per NACE Standard Practice SP0176-2007 and DNV Recommended Practice DNV-RP-B401. Voltage potentials greater (more electronegative) than -800 mV SSC indicate that the CP system is providing adequate protection for the steel, and active corrosion is not occurring below water.

3.0 INSPECTION FINDINGS AND RECOMMENDATIONS

General Condition

The overall condition of the dock is **satisfactory to critical** based on current observations. Moderate to severe defects are present throughout the structure and significantly reduce the load carrying capacity of the structure as reported in the previous inspection results. This years' inspection did not find any evidence that would have further detriment to the previously estimated load capacity. See Section 4.0 for these load restrictions.

Cathodic protection of the steel is of significant concern for this dock. According to previous inspections reports there previously was an impressed current system protecting the steel elements of the dock. The previous inspection findings indicated, when evaluating the rectifiers and evidence from the dive inspections, that the system was no longer functional and in need of repairs. At the time, it was recommended a corrosion specialist conduct an evaluation to best determine repairs or replacement of the

existing CP system. PND's findings for the CP for the hull and caissons are discussed in the respective sections below.

Findings and recommendations for individual components are discussed below. Cost estimates for repairs and component condition ratings can be found in Section 4.0. Photo references are found in Appendix A. Locations of noted deficiencies are identified in Appendix B along with concept repair details for select recommendations. UT thickness measurements and CP readings taken on select locations are discussed below in the corresponding sections. Refer to Appendix C for UT and Appendix D for CP field data recorded.

Deck & Transition Bridge

The deck components, including the transition bridge between barges, appear to be in **satisfactory** condition. Only two locations were noted with deterioration recommended for repair as discussed below.

- A patch on the western barge is experiencing severe cracking and spalling (Photo 25). Surrounding concrete sounds hollow indicating a poor bond to the subsurface and higher likelihood for future spalling. The deteriorating concrete should be removed and patched.
- The transition bridge slab is also seeing signs of distress along the constructing joints where the joint filler has deteriorated (Photo 23-24). The joint should be cleaned out and sealed to prevent dirt, moisture, and vegetation from growing in this area.
- Some of the secondary supports beneath the transition bridge slab were found bent, and one (1) fractured (Photo 7). These members were likely placed to support the corrugated steel pan decking during the initial slab pour. The adjacent primary support beams appear to be in fair condition. Therefore, repairs are not recommended at this time.

Steel Hull

The hull appears to be in **poor** condition due to significant corrosion and section loss. The highest level of corrosion and marine growth was on the bottom third of the hull where salt water can enter and exit the interior portions of the barge through hull penetrations. This continuous moisture presences allows for accelerated corrosion.

While the current inspection efforts did not consist of accessing the interior barge components, the 2014 inspection did observed several inches of sludge on the floor of the barge and active corrosion throughout. It is recommended the next routine inspection include interior portions to verify the progression of interior deficiencies and current condition. Cathodic protection was not identified on the interior of the barge at the time and the topside CP rectifiers appeared non-functional. Sacrificial zinc anode bars observed on the exterior bottom face of the east barge hull during the 2018 inspection were newly installed (bid 2017) and appear in good condition (Photo 20). The hanging anodes connected to the topside impressed current system were noted to have broken wires to the topside rectifier and several bars broken off as discovered during the 2014 underwater inspection. An underwater inspection is recommended to verify the extent of cathodic protection repairs made as underwater pile anodes were not visually observed. This data would provide valuable information needed to evaluate the path forward and future repairs.

UT readings taken on the hull sides of both barges and the bottom face of the west barge. A total of ten (10) measurements were taken at varying locations and heights. Thicknesses range from 0.155" to 0.695". It should be noted that internal steel angles and stiffeners are welded throughout the hull structure and are likely to have some interference with measurements. The measurements were documented for future reference as the 2014 inspection focused primarily on the caissons. There is little data applicable for

comparison. However, it is evident the hull has significant corrosion and in need of cathodic protection. Additional deficiencies observed are noted below.

- Two (2) small diameter holes were found on the stern of the eastern barge (Photo5). It is unknown if these were intended drain holes or areas of significant corrosion and section loss. It is recommended this area be monitored in future inspections for accelerated corrosion.
- One (1) large diameter drain hole on the north face of the eastern barge had 100% section loss over a 6"x12" area (Photo 10). This is more corrosion observed than at any other drainage hole. As recommended in 2014, installing or restoring the cathodic protection system would minimize further deterioration of the barge hull.
- The north pipe brace on the eastern barge rake is cracked in multiple locations, likely due to vessel impact (Photo 11-12). If the eastern and northern faces of the barge are going to be utilized for future mooring and berthing, it is recommended these cracks be repaired. Otherwise, these may be left in their current condition as they do not provide any significant structural benefit.
- (Identified 2014) One (1) interior longitudinal bulkhead was cracked full height on the interior of the western barge between bents 3 and 4. This was recommended for repair during the previous inspection and its current condition was not confirmed during this inspection.

Fender Systems

There are three main fender systems on the eastern barge referenced by their location. Their conditions are **critical** to **poor** at best and require significant repairs. Reference Appendix B for locating noted deficiencies and recommended repair concept details.

North fender system - timber rub strips bolted to steel angles. Condition **critical**.

- The steel angles are attached directly to the barge hull and provide no energy absorption for vessel impact. The steel angles appear to be remnants of a previous system, most of which is missing. The fenders and attachments are severely deteriorated or missing (Photo 8-9). Much of the fender system is unusable and is recommended to be replaced with a modern energy absorbing system. There are a number of different fender systems available depending on the intended future use. Considering the condition of the overall condition of the dock, anticipated lifespan, and light commercial use, it is recommended a simple floating foam fender be installed.

East fender system - three (3) hollow steel sections (HSS) with UHMW facing. Condition **poor**.

- These fenders are attached directly to the hull and do not provide any energy absorption under impact. Two (2) of the three (3) HSS members have visible deformation from vessel impact and the light pole on this face has also been damaged (Photo 14). The northernmost HSS was also noted to not have support below the hull where the others are supported by pipe bracing (Photo 15). The narrow width and distance spacing of the fenders are not recommended for smaller vessel mooring or larger vessels as there's no appropriate points of contact on the southern half of the face. If this face is desired for future berthing, at a minimum it is recommended energy absorption rubber fenders be attached the HSS to sustain impact and only vessels that fit within the contact areas of the fenders be moored at this location.

South fender system - timber pin pile with timber blocking, walers, and a rubber fender element attached to the hull. Condition **serious**.

- The timber pin pile and blocking are generally in need of replacement. Six (6) of twenty-nine (29) pin pile are broken or otherwise missing (Photo 16-17). The majority of the remaining pile have

moderate to severe damage at the waler connections (Photo 18). It is recommend all of the pin pile and timber blocking be replaced in-kind assuming future use is from light commercial vessels only. The rubber fender elements and timber waler are in fair condition with appreciable light commercial service life remaining.

Steel Caissons

The 6 foot diameter caissons are in **critical** condition. Significant marine growth was observed throughout. Anodes were not observed on any of the supporting pile for either barge during the day's low tide. PND took CP readings on select west barge pile to verify protection of the pile. Readings revealed the pile are below the cathodic potential threshold. PND was unable to verify if anodes had been installed per a 2017 Alaska Railroad Corp. bid document. It is possible sacrificial anodes were installed but may not have been adequate cathodic protection or already depleted since installation. The longevity of sacrificial anodes depends on their size and spacing along the structure, however based on the size observed on the bottom face of the hull, typical life spans for these anode bars are 5 to 10 years. An underwater inspection is recommended to help determine the extent of cathodic protection needs. Additional items of note are as follows:

- UT readings taken on two (2) of the west barge caissons revealed an average steel thickness of 0.68 inches. Assuming the original thickness of 1 inch, this represents a 32% loss in material due to corrosion. This is similar to the readings found in 2014. While this deterioration is significant and of structural concern, previous analysis indicates the reduced section still sufficient for light commercial vehicles, however this will continue to weaken without cathodic protection. Refer to Section 4.0 for a summary of the 2014 load restrictions.
- CP readings were taken on two (2) of the west barge pile and were found to be actively corroding. The 2014 inspection revealed similar results and cathodic protection was recommended at the time. It does not appear this has been resolved on the west barge. The east barge caissons were inaccessible during low tide are therefore not inspected. It is recommended a dive inspection be conducted to capture UT and CP readings for comparison against previous values.
- Pile knee bracing is typically observed having 100% section loss of the webs (Photo 21). The original intent of these braces is unknown. It is possible these were utilized during construction and have no structural relevance. The available design drawings have no reference of these either. It is likely these braces have been deteriorated for much of the 65-year-old dock's life and there appears to be no indications of load path failures or damage to the hull. Therefore, it is recommended these braces be left as-is and monitored in future inspections. However, for reference, PND has provided a cost estimate for replacing all these members in Section 4.0.

Light Poles

- The light pole on the pole near bent 15 has damaged steel straps that should be replaced immediately as they are the primary tie-downs for wind loads (Photo 19).
- It appears the light pole on the eastern face of the east barge has been used as a mooring point for vessels (Photo 14). This is an unacceptable berthing point and could severely affect the structural integrity of the light pole and/or its attachments if impacted. This is likely the cause for the damaged steel strap and fractured steel support. Timber crushing was also observed at the butt of the pole. Any intended berthing on this face should be done so as to not come in contact with the any of the light pole components. If future berthing on this face is desired, it is recommended the steel framing or large fenders be installed around the light pole to prevent any vessel contact with the timber and its supporting components. The steel strap should be replaced in-kind and supporting steel seat be repaired by welding new steel plate around the damage. A thorough

investigation of remaining components is recommended as the noted observations were made from a distance and additional deficiencies may be present.

Timber Bullrail

Timber bullrails are in varying degrees of deterioration. Many sections of the rail have been recently replaced and are in good condition. The remaining areas of the bullrail are typically in need of replacement due to severe splitting or rot.

- Splitting, rotting, or otherwise deteriorated timber throughout the perimeter of the dock was observed (Photo 26-27). Replace timbers in-kind. The majority of the attachment hardware are in good condition and are likely reusable for the new timber.
- Two (2) bullrail locations on the north face of the east barge are in need of bolt replacement (Photo 28). The timber rail appeared to be in good condition and may be reused.

Miscellaneous Utilities

- Piping, electrical and impressed current systems, though outside of PND's scope, appeared abandoned and unserviceable (Photo 29). It is recommended these be tagged or removed to minimize confusion and safety risks in case some utilities are still active.
- Fire extinguishers have been installed since the previous inspection in 2014. At the time the fire standpipe system and monitors appeared abandoned and unserviceable. A total of five (5) new extinguishers were found mainly of the south face of the dock, attached to the light poles (Photo 30).
- Life rings were found in seven (7) locations around the perimeter of the dock (Photo 31). Three (3) new rings were installed as recommended previously.
- Ladders, where identified on the plans, are unserviceable due to damage or are unreachable at low tide. Two (2) ladders require extension below the hull (Photo 32) and one (1) landing grab bar needs to re-attached to the bullrail (Photo 33). Repairs assume ladder type similar to existing ladders on the dock. However, it is recommended any new ladder to be replaced, including any on berthing faces that are subject to impact should be replaced with modern rubber energy absorbing ladder components.

Catwalks

- Fractures were observed on the hand rails around one of the east barge catwalks (Photo 34). These should be repaired, replaced, or barricaded to minimize safety concerns.

4.0 CONCLUSIONS AND REPAIR ESTIMATES

The above water sections of the Delong Dock were found to be in **satisfactory** to **critical** condition due to corrosion, vessel impacts, and general exposure observed during the 2018 and 2014 inspections. Due to the level of section loss of the caissons and hull, the structural capacity of the dock was **reduced** in 2014 as follows:

Load Restrictions (from 2014 analysis)

- 400 PSF uniform distributed load
- HS20-44 live load
- Front end loader/forklift with 10.5 kip wheel load
- 20 ton lift capacity truck mounted hydraulic crane (outrigger pads must be placed no further than 25 feet from the top of a caisson)

PND did not find any evidence to warrant further reduction in load capacity at this time. However, the below water sections are recommended for underwater inspection to evaluate the progression of caisson section loss and the status of cathodic protection. Further reduction in load carrying capacity may be required if significant deterioration has progressed since 2014. Similarly, the interior barge components should be inspected for further deterioration prior to any fender repair requiring hull attachment, or during the next routine inspection.

If the dock is to remain serviceable for berthing operations, fenders should be repaired and/or replaced as recommended. The current fender systems for the dock are in poor condition at best and require significant upgrades to be structurally safe for vessel impact.

A summary condition rating is presented for each structural component noted below.

Condition Ratings

Inspections were performed with guidance and recommendations from the ASCE Waterfront Facilities Inspection and Assessment, 2015. When referencing a structural component's condition in the following paragraphs, assessment ratings are based upon the ASCE nomenclature.

Component	Condition Rating		Notes
	2014	2018	
Deck	5 Satisfactory	**5 Satisfactory**	Minimal noted defects
Hull	3 Poor	**3 Poor**	Extensive corrosion and marine growth
Caissons	1 Critical	**1 Critical**	Significant section loss (previously reported)
South Fenders	4 Fair	**2 Serious**	Most pile are not structurally adequate to support berthing loads and are in need of replacement
North Fenders	1 Critical	**1 Critical**	The majority of the components are severely damaged or missing
East Fenders	4 Fair	**3 Poor**	Inadequate system causing damage to fenders and adjacent light pole.
CP System	2 Serious	N/A	Not included in 2018 inspection scope; Impressed current system not functional (previously reported)
Bullrail	4 Fair	**4 Fair**	Sections are in need of replacement
Ladders	3 Poor	**4 Fair**	Several new ladders have been installed since previous inspection; repairs are still recommended
Fire Suppression System	2 Serious	**4 Fair**	Fire extinguishers have been installed since previous inspection
Life Rings	3 Poor	**4 Fair**	Life rings have been installed since previous inspection
Electrical/ Lighting	4 Fair	N/A	Not included in 2018 inspection scope;
Utility Piping/Conduit	2 Serious	N/A	Not included in 2018 inspection scope;

It should be noted that typical dock structures have an intended life span of 30 to 50 years depending on dock use and client needs. However, in all cases, regular maintenance and inspections are required to identify damaged and degrading materials before they adversely affect the structural integrity. Minimal records of the original design drawings exist, specification on the intended design life of the structure was not listed. It can be concluded, based on age of the structure and observed deterioration, the structure is near the end of its expected life. However, with some structural repairs, corrosion protection and preventative maintenance the service life of dock may be extended significantly. The extent of repairs and proactivity of maintenance will determine the structures remaining life.

Cost Estimates

Rough order-of-magnitude (ROM) costs are provided to capture the materials and installation of the recommended repairs. For budgetary planning purposes it is recommended that an additional 10 percent of the cumulative repair costs be incorporated into the project cost to account for final design, permitting, construction administration and field engineering services. All costs are presented in current (2018) United States Dollars.

Repair	Quantity	Unit price	Total Price
North Fender Replacement (excl. ladders)	1 LS	$270,000	$270,000
North Face Ladder Replacement (recommended for new fender concept)	3 EA	$20,000	$60,000
East Fender Upgrade	3 EA	$18,333	$55,000
South Fender Repairs	1 LS	$230,000	$230,000
Deck Patch and Joint Repair	1 LS	$6,000	$6,000
Timber Bullrail Replacement	150 LF	$100	$15,000
Light Pole Repairs	1 LS	$3,000	$3,000
Knee Brace Replacement	50 EA	$9,600	$480,000
Existing Ladder Repair	1 LS	$3000	$3000
Catwalk handrails	1 LS	$1,000	$1,000
Dive Inspection w/ CP & UT	1 LS	$45,000	$45,000
Cathodic Protection Repairs	TBD	TBD	TBD upon dive inspection
Construction Contingency	LS	15%	15% of cumulative cost
A number of other repair items (i.e. cracked bulkhead, interior anodes, impressed current CP system inspection and repair, utility/electrical removal or repair, etc.) were provided in the 2014 inspection report but were not accessible or outside of the 2018 scope. Refer to the 2014 report for additional details.			

It is the opinion of PND that the dock is nearing the end of its useful life and the scope and cost to repair and maintain the structure will increase in the future. The underwater dive inspection is needed to evaluate progression of corrosion and required repairs. PND recommends performing a cost benefit analysis of the dock in the near future to further evaluate operational desires, service life, and cost of maintenance versus replacement.

In addition to the repairs, we recommend routine visual inspection of the dock every 2-years and underwater inspection every 4-years based on its current condition. Future inspections should monitor any previously noted defects, repairs completed, and evaluate progression of deteriorating components to ensure the dock is regularly maintained and remains safe and serviceable.

APPENDICES:

Appendix A – Inspection Photos
Appendix B – Inspection Plan & Concept Repairs
Appendix C – UT Measurements
Appendix D – CP Voltage Readings

Appendix A – Inspection Photos

Photo # 1

Description:

Delong Dock looking south.

Photo # 2

Description:

North face of western barge looking West.

Photo # 3

Description:

West barge monopile fender.

Photo # 4

Description:

South face of western barge looking northwest.

Photo # 5

Description:

Transition bridge between barges.

Photo # 6

Description:

Transition bridge supporting beams.

Photo # 7

Description:

Damaged secondary support member.

Photo # 8

Description:

East Barge looking south.
(Note deteriorated and missing fendering)

Photo # 9

Description:

North face of east barge looking west. (Note enlarged drain hole and deteriorated timber fendering)

Photo # 10

Description:

Significant corrosion around drain hole.

Photo # 11

Description:

Pipe bracing on rake of eastern barge.

(Note steel fractures at top connection)

Photo # 12

Description:

Steel fractures around rake pipe bracing.

Photo # 13

Description:

East barge bow rake fenders

Photo # 14

Description:

East barge bow looking north.

Photo # 15

Description:

East barge south face timber fenders.

Photo # 16

Description:

Broken timber fenders on south face of East barge.

Photo # 17

Description:

Missing timber fender pile.

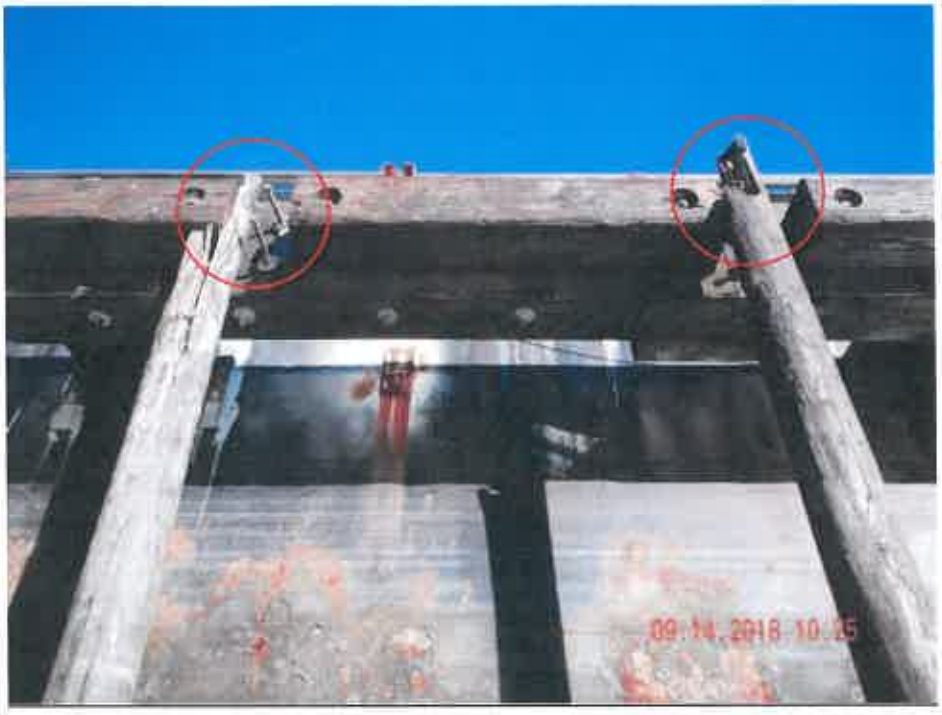


Photo # 18

Description:

Typical damaged to timber fender pile connections.

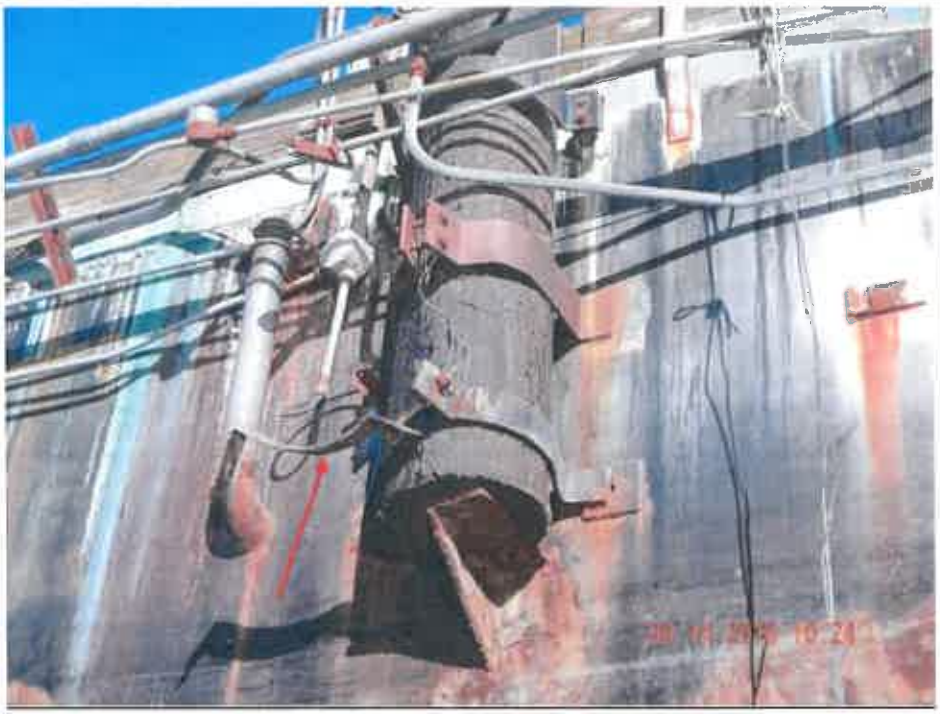


Photo # 19

Description:

Damaged strap on light pole, south face of east barge.

Photo # 20

Description:

East barge hull zinc anodes.

Photo # 21

Description:

Pile knee bracing with 100% section loss in webs, typ.

Photo # 22

Description:

East barge deck looking east.

Photo # 23

Description:

Transition bridge joint.

Photo # 24

Description:

Transition bridge joint cracking.

Photo # 25

Description:

Cracking/ spalling on slab patch of west barge.

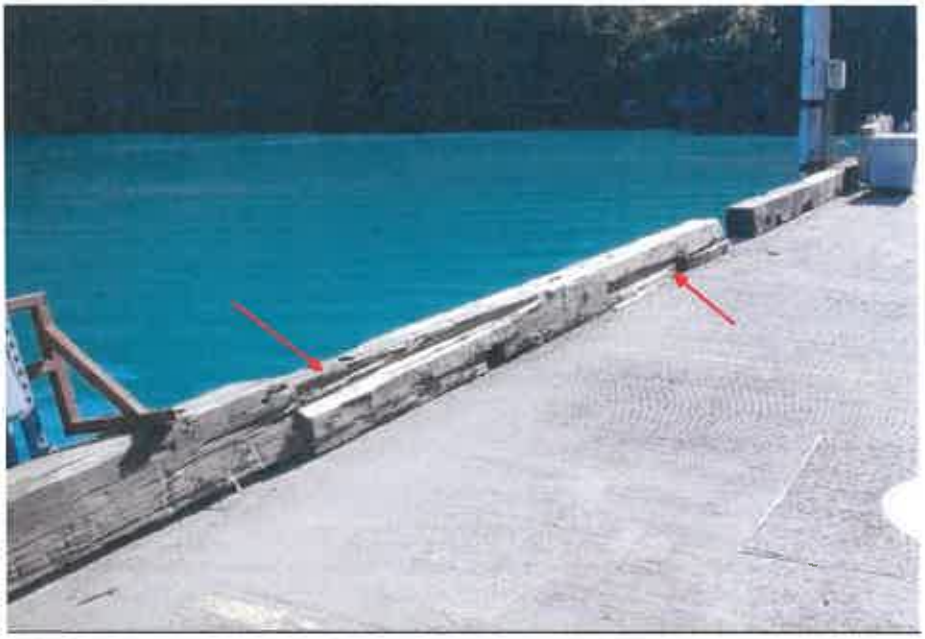


Photo # 26

Description:

Deteriorated timber bull rail on east edge of east barge.

Photo # 27

Description:

Typical damaged/deteriorated bullrail.

Photo # 28

Description:

Sheared bullrail bolt on north edge of east barge.

Photo #29

Description:

Abandoned utility piping on south face.

Photo # 30

Description:

Typical fire extinguisher on deck.

Photo # 31

Description:

Typical life ring on deck.

Photo # 32

Description:

West barge ladder inaccessible at low tide.

Photo # 33

Description:

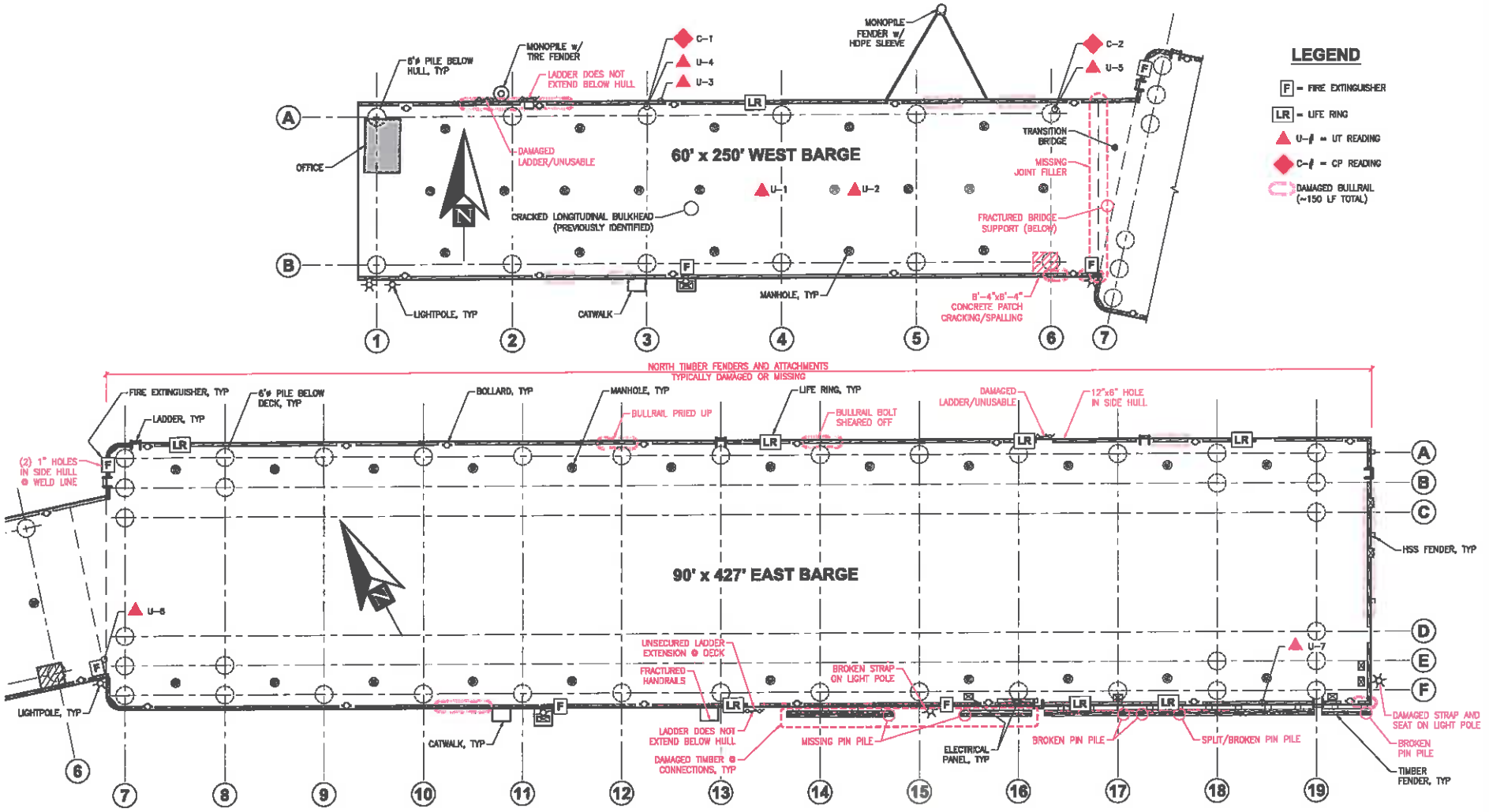
Landing grab bar detached from bullrail on east barge ladder.

Photo # 34

Description:

Fractures on handrail on fire standpipe platform.

Appendix B – Inspection Plan & Concept Repairs



CITY OF WHITTIER
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DRAFT
10/17/2018

PND Engineers, Inc. is not responsible for safety programs, methods or procedures of operation, or the construction of the design shown on these drawings. Where specifications are general or not called out, the specifications shall conform to standards of industry. Drawings are for use on this project only and are not intended for reuse without written approval from PND. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PND.

REV	DATE	DESCRIPTION

DATE: _____

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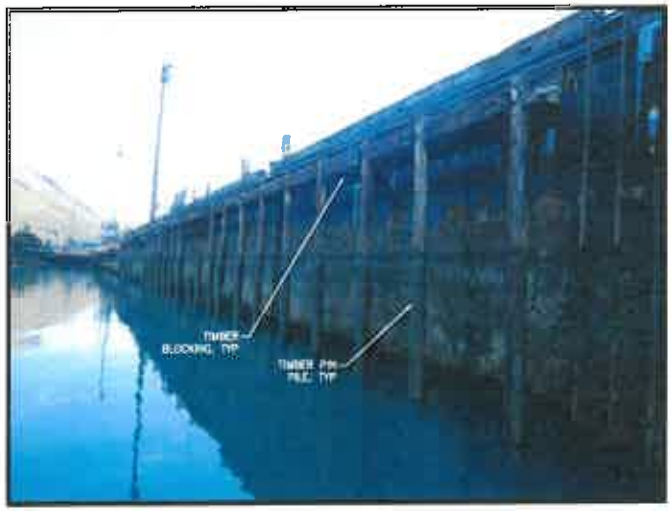
Phone: 907.561.1011
Fax: 907.563.4220
www.pndengineers.com
PND ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK INSPECTION

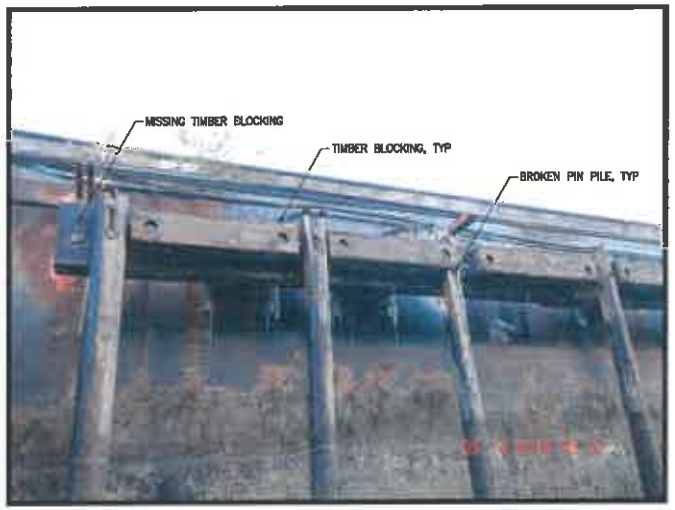
TITLE: INSPECTION PLAN

DESIGNED BY:	MAB	DATE:	10/17/18
CHECKED BY:	DST	PROJECT NO:	181137

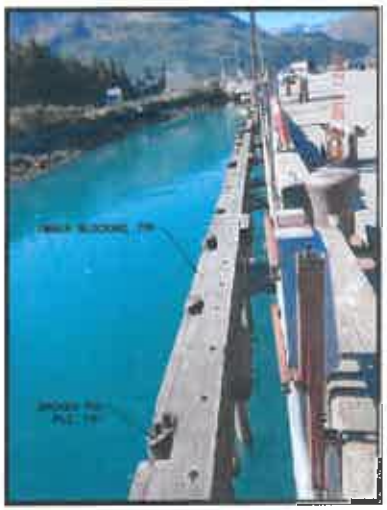
SHEET NO. 1 OF 1



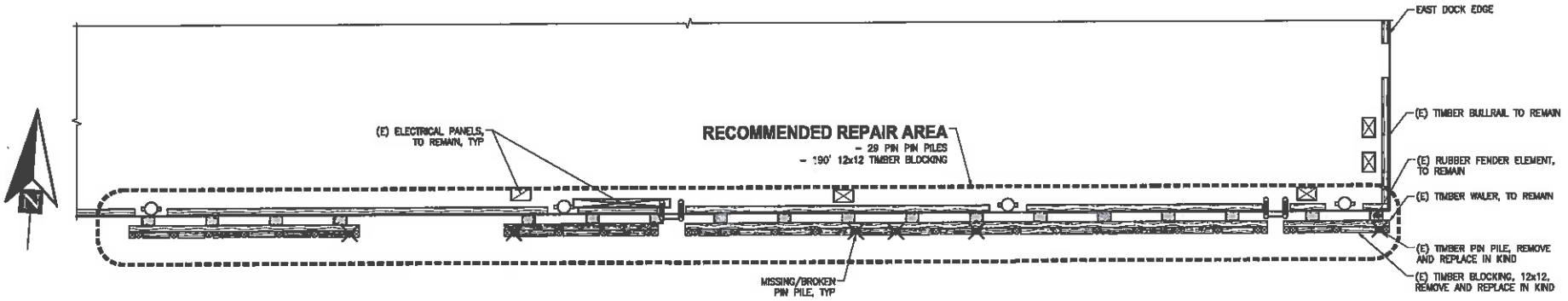
SOUTH FENDER SYSTEM - OVERVIEW



WALER PIN PILE CONNECTION



FENDER SYSTEM - TOP VIEW



DELONG DOCK - SOUTH FENDER PLAN

NTS

CITY OF WHITTIER
PO BOX 608
WHITTIER, ALASKA 99693
PHONE: (907) 472-2327
FAX: (907) 472-2404

CONCEPT
10/17/2018

REV	DATE	DESCRIPTION

DATE: _____

1506 West 36th Avenue
Anchorage, Alaska 99503
Phone: 907.561.1011
Fax: 907.563.4220
www.pndengineers.com

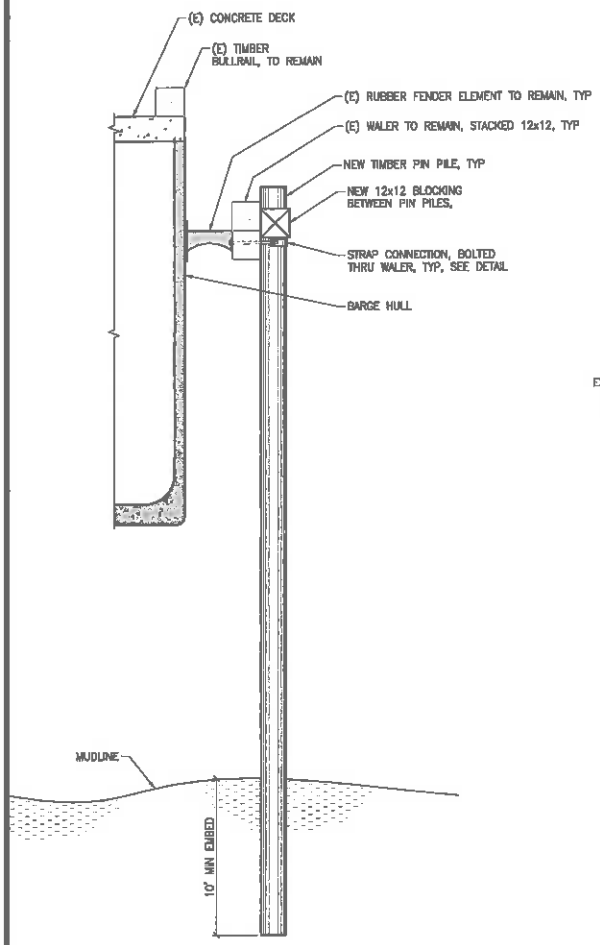
P N D ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK REPAIRS

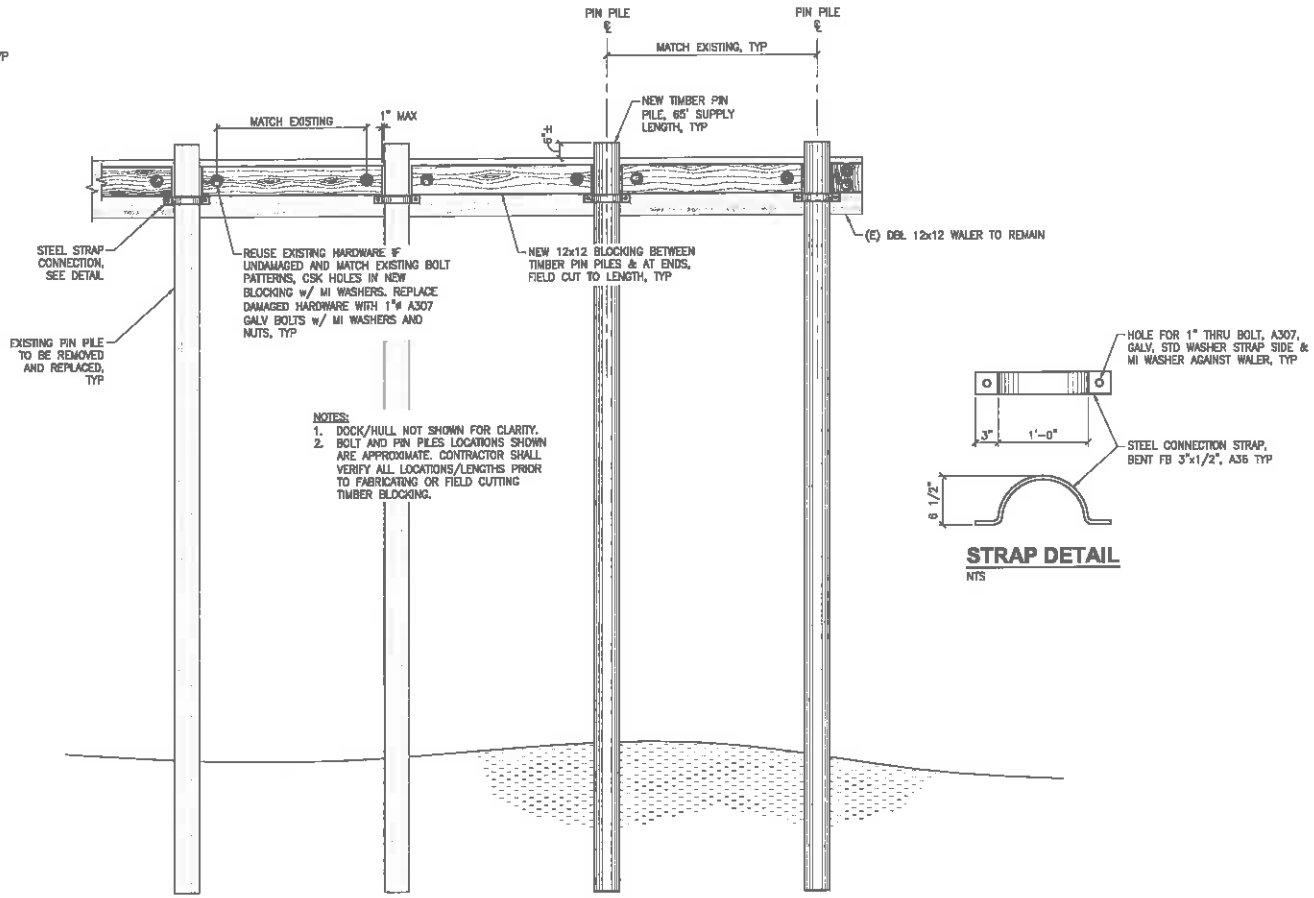
TITLE: SOUTH FENDER REPAIR - OVERVIEW

DESIGNED BY:	MAB	DATE:	11/14/18
CHECKED BY:	DST	PROJECT NO:	181137

SHEET NO. 1 OF 5



TYPICAL FENDER REPAIR SECTION
NTS



TYPICAL FENDER REPAIR ELEVATION
NTS

STRAP DETAIL
NTS

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DATE: _____

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P N D ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK REPAIRS

TITLE: SOUTH FENDER REPAIR DETAILS

DESIGNED BY:	MAB	DATE:	11/14/18
CHECKED BY:	DST	PROJECT NO:	181137

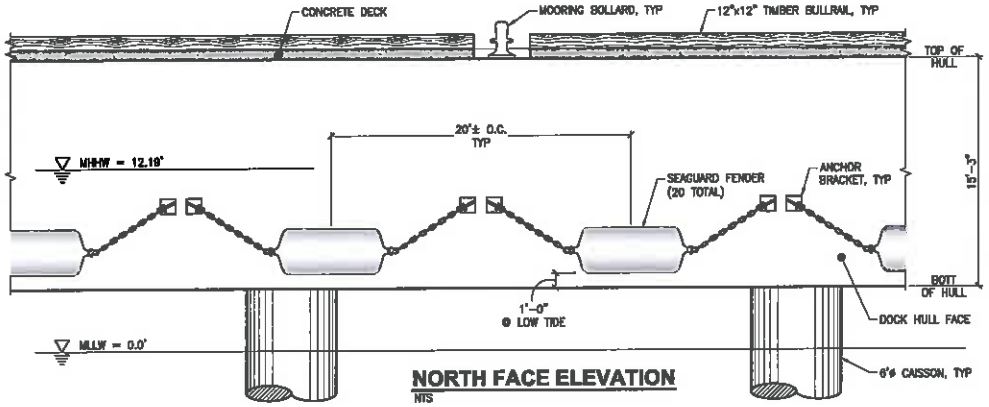
SHEET NO: 2 OF 5

NORTH FENDER SYSTEM - OVERVIEW

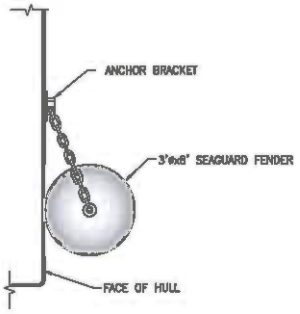
NORTH FENDER SYSTEM - OVERVIEW

NOTES:

1. REMOVE EXISTING TIMBER FENDERS (~900 LF) AND ANGLE BRACKET ATTACHMENTS (200 EA).
2. REMOVE DAMAGED OR UNUSABLE LADDERS AS DIRECTED BY OWNER.
3. REATTACH HANGING UTILITY LINE TO BULLRAIL.
4. INSPECT HULL INTERIOR FOR OPTIMUM LOCATION TO ATTACH ANCHOR BRACKETS.
5. INSTALL (20) NEW SEAGUARD FENDER AT EQUAL SPACING ALONG NORTH FACE.



NORTH FACE ELEVATION
NTS



FENDER DETAIL
NTS

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WHITTIER, ALASKA 99693
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FAX: (907) 472-2404

CONCEPT
10/17/2018

REV	DATE	DESCRIPTION

DATE: _____

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Fax: 907.563.4220
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P N D ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK REPAIRS

TITLE: NORTH FENDER REPAIR

DESIGNED BY:	MMB	DATE:	11/14/18
CHECKED BY:	CST	PROJECT NO:	101137

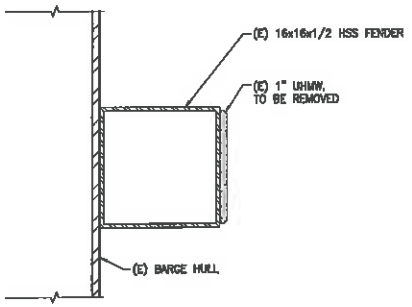
SHEET No. 3 OF 5

EAST FENDER SYSTEM - OVERVIEW

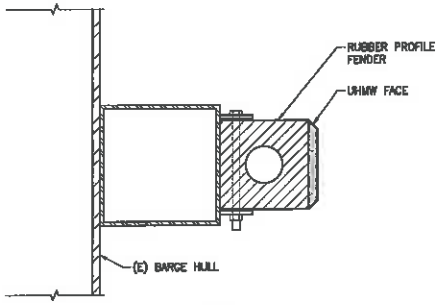
EAST FENDER - TYPICAL

NOTES:

1. REMOVE EXISTING UHMW RUBSTRIP.
2. CLEAN SURFACE OFF HSS AS NEEDED FOR NEW FENDER.
3. INSTALL (3) NEW COMPOSITE FENDERS ON TO EXISTING HSS AS DETAILED.



EXISTING



NEW

EAST FENDER PLAN

NTS

CITY OF WHITTIER
PO BOX 608
WHITTIER, ALASKA 99693
PHONE: (907) 472-2327
FAX: (907) 472-2404

CONCEPT
10/17/2018

REV	DATE	DESCRIPTION

DATE: _____

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Anchorage, Alaska 99503
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Fax: 907.563.4220
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P N D ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK REPAIRS

TITLE: EAST FENDER REPAIR

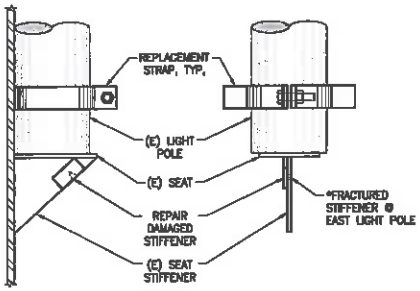
DESIGNED BY:	MAB	DATE:	11/14/18
CHECKED BY:	DST	PROJECT NO:	181137

SHEET NO: 4 OF 5

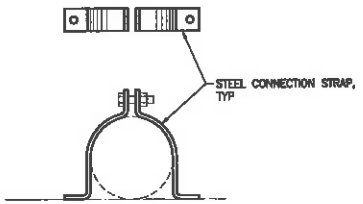
SOUTH LIGHT POLE

EAST LIGHT POLE

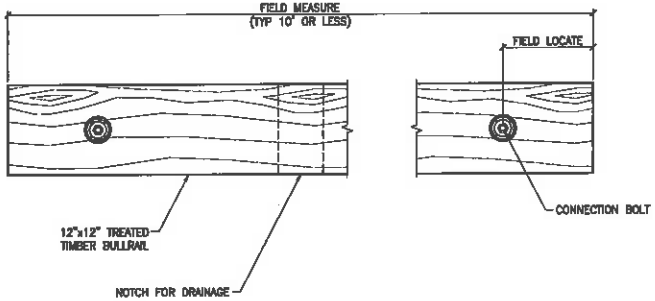
TYPICAL BULLRAIL



LIGHT POLE DETAIL
NTS



STRAP DETAIL
NTS



BULLRAIL DETAIL
NTS

CITY OF WHITTIER
PO BOX 608
WHITTIER, ALASKA 99693
PHONE: (907) 472-2327
FAX: (907) 472-2404

CONCEPT
10/17/2018

REV	DATE	DESCRIPTION

DATE: _____

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Anchorage, Alaska 99503
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Fax: 907.563.4220
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P N D ENGINEERS, INC.

PROJECT: WHITTIER DELONG DOCK REPAIRS

TITLE: MISCELLANEOUS REPAIRS

DESIGNED BY:	MAB	DATE:	11/14/18
CHECKED BY:	DST	PROJECT NO:	181137

SHEET NO: 5 OF 5

Appendix C – UT Measurements

DELONG DOCK INSPECTION SCHEDULE

PILE DESIGNATION / INFORMATION (Plans desig.)		UT MEASUREMENTS (INCHES) @ LOCATION: Reading 1	Reading 2	Reading 3	Reading 4		REMARKS
West Barge -Hull #1 (U-1)	Location	0'	0'	0'			(poor contact) Midspan hull btwn bent 4
	Measured Thickness	0.670	0.223	0.305			
West Barge -Hull #2 (U-2)	Location	0'					Midspan hull btwn bent 5
	Measured Thickness	0.695					
West Barge -Hull #3 (U-3)	Location	0'					Near pile 3A
	Measured Thickness	0.155					
West Barge -Pile 3A (U-4)	Location	-1'					North face
	Measured Thickness	0.635					
West Barge -Pile 6A (U-5)	Location	-1'					North face
	Measured Thickness	0.725					
East Barge -Hull #1 (U-6)	Location	+3'	+3'	+6'	0'		East face near pile 7E
	Measured Thickness	0.275	0.315	0.445	0.290		
East Barge -Hull #2 (U-7)	Location	+1'					South face btwn bent 18-19
	Measured Thickness	0.575					

GENERAL CONDITIONS NOTES/COMMENTS:

Locations shown reference distance from the bottom of hull to UT measurement.

Appendix D – CP Voltage Readings

DELONG DOCK INSPECTION - CP Voltage Potential Readings

PILE DESIGNATION (Plans desig.)	Voltage Measurements (mV) @ Distance Below Water Surface											REMARKS
	0'	5'	10'	15'	20'	25'	30'	35'	40'	45'	50'	
West Barge Pile 3-A (C-1)	-617	-617	-616	-643	-640							ML ≈ 19'
West Barge Pile 6-A (C-2)	-627	-630	-629	-628	-629							ML ≈ 20'

GENERAL CONDITIONS NOTES/COMMENTS:

Baseline potential on unprotected steel (2.5"Ø x 12" Sch 40 Steel Nipple) with Silver/Silver Chloride reference cell = 472 mV.

CP readings on the East Barge were unavailable due to tide levels.

Voltage potentials at or more negative than -800mV are considered adequately protected from corrosion.